

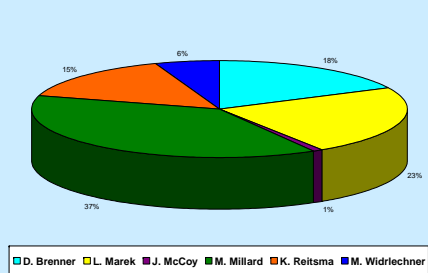
**OUR MISSION** is to conserve genetically-diverse plant genetic resources, or germplasm, and associated information, conduct germplasm-related research, and encourage the use of germplasm and associated information for research, crop improvement and product development.

The creation of the NCRPIS was authorized by the Congressional Hatch Act in 1946. In 1999 the station celebrated its 50<sup>th</sup> anniversary. It is one of four Regional Plant Introduction Stations in the U.S., known within the CSREES system as the NC-7 Project, and one of 20 active sites that make up the National Plant Germplasm System (NPGS).

Located near the ISU campus, the station benefits from the strong infrastructure and educational advantages available to it from local Iowa State University and other ARS research, administration and facility infrastructure.

The NCRPIS is a joint venture of the USDA-ARS, the Agricultural Experiment Stations of the North Central Region, and Iowa State University

## 2006 Distribution of 48,639 Accessions by Curator



M. Millard	
Type	# Accessions
Maize Landraces	14,731
Temperate US	1,320
Temperate Intl.	3,552
Tropical Intl.	9,859
Improved Populations	1,394
Temperate US	809
Temperate Intl.	253
Tropical Intl.	337
Inbred Lines	2,039
Temperate US	1,480
Temperate Intl.	372
Tropical Intl.	187
Teosinte(International)	239
<b>Total</b>	<b>18,403</b>



## Who Benefits from Plant Genetic Resource Conservation & Utilization?

Each and every member of society benefits in some way. By preserving plant genetic resources, we ensure that production of food, feed, fiber and many other plant products can be sustained for the future. Stable production of such products contributes to economic stability and the basic security of a global society.



## What are plant genetic resources or plant germplasm?

A plant's nature is determined by the genetic information stored in seeds and plant cells. Plant germplasm refers to seeds or clonally propagated plants that are viable and that can be grown and express their genetic potential. The NCRPIS collections contain over 48,000 accessions, or different varieties of plants. The collections represent approximately 1300 species of over 300 different genera.

## Why is germplasm conservation important?

Crop improvement and new crop development depends upon availability of well-characterized, well documented plant germplasm to provide genes and traits. Wild relatives and domesticated landraces are important as sources of disease and pest resistance, adaptation, biochemical or agronomy traits, as well as aesthetic traits such as flower color and aroma, shape and form. Preserving cultivars that served important functions during crop improvement is also very important.

## Why is germplasm acquisition important?

Much of the native plant diversity on earth is vanishing at an ever increasing rate. Some is lost due to habitat loss. Human activities such as urban development and overgrazing completely eliminate or alter the environment. Climate change affects distribution of plant species, as do disasters from either natural or human-caused phenomena. Duplication of collections between genebanks is also important for security; on multiple occasions germplasm has been lost from its native country due to natural disasters, civil wars and other reasons. Germplasm has been repatriated from U.S. and other genebanks to the countries of origin, when available.

If a species is found only in a small area, it is at higher risk than one that is adapted to many ecogeographical conditions. Acquisition and maintenance of species that can contribute to crop development that are at risk is a high priority.

## Who uses plant germplasm?

Researchers and educators from the U.S. and all over the world request genetic resources to fulfill their objectives. The germplasm bank can be thought of as a 'library'; resources are checked out to meet a need. Their learning and findings can be checked back in, adding to the information known about specific accessions.

## What is plant germplasm used for?

**Educators** use the materials to teach about principles of plant growth and metabolism, and to train future plant researchers.

**Researchers** use it for a wide array of objectives, some of which are listed below.

Crop Improvement:

- New crop variety releases
- Identification of genes or genetic processes
- Identification of sources of specific traits :
  - Adaptation – where it can be grown
  - Disease or Insect Pest Resistance
  - Improved Agronomics such as Yield, Stalks, Roots
  - Energy Production
  - Improved Flavor, Nutritional, Cooking or Other Characteristics
  - Industrial uses such as solvents, lubricants, detergents and cosmetics
  - Aesthetic properties such as flower color, aroma, shape or size
  - Fiber production

Medicinal Products Research  
Invasive species and risk assessment research  
Development of new knowledge



## How can germplasm be obtained from the NCRPIS?

Germplasm can be requested on-line at the Germplasm Resources Information Network (GRIN) database <http://www.ars-grin.gov/ngps/index.html>, via email, phone or letter communication with crop curators.

## What are the Unit's Functions?

### Acquisition

We collect plants and seeds from their native habitats, exchange materials with other genebanks, or obtain them through the researchers who developed them. At the NCRPIS, our primary focus is on heterogeneous, heterozygous, outcrossing species adapted to environmental conditions similar to those of the Midwestern U.S. We collect passport and provenance information that describe where an accession came from and what that habitat was like; this helps us know where it could be adapted and grown by others.

### Documentation

Collected information is stored and managed in the publicly available, web-accessible GRIN database.

### Regeneration and Maintenance

Plants are grown under controlled conditions to preserve their original genetic profile, or identity. Pollen spread is controlled by hand or in caged systems using insects to transfer it to plants within a cage. Our pathologist works with the curatorial teams to ensure that the plants are healthy and that we harvest disease-free seed for distribution to others.

### Characterization and Evaluation

Plants can be described in many ways. Morphology refers to their form (shape, size, architecture and structure) while phenology refers to the process of development from germination to flowering to seed maturation. Many agronomic or other types of performance traits are measured, for example yield, disease or insect resistance level, or production of a specific chemical or metabolite. Molecular characterization is done in the laboratory using DNA based markers or isozymes, which are protein based markers. Information helps tell the story of what a plant is and what kind of things it can do, and greatly increases the value of an accession.

### Distribution

Plant germplasm is sent to researchers and educators in both the U.S. and internationally, free of charge.

### Enhancement

Germplasm pre-breeding activities are conducted so that germplasm can be refined and released that is more suitable for use in breeding programs. Some crops have been under develop for a long time, and are very different from wild or primitive types. It would not be feasible for breeders of these crops to use material in its more primitive form. The Germplasm Enhancement of Maize Project (GEM) is an example of a public-private cooperative enhancement program devoted to diversifying the genetic base of U.S. maize production.



## Providing Plant Genetic Resources for Agricultural Success